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Wilderness Ranger's Guide

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PREPARED BY Forest Service

Southwestern Region

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Wilderness Ranger's Guide

As a Wilderness Ranger you have a unique opportunity to help in the preservation of our environment and the maintenance of a healthy system of wilderness. You will influence people to further this preservation effort by fulfilling management policies. You are essential. You are the most important person in carrying out the mandate of Congress written in the Wilderness Act of 1964 stating that wilderness "... shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness and so as to provide for the protection of those areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use as wilderness..."

This Wilderness Ranger's Guide is for use during patrols and work assignments related to wilderness designated by Congress. It provides a quick and ready reference to information you will need in performing your day-to-day activities. More detailed information should be provided through training, background reading and your supervisor. The Guide is designed to accommodate insertion of Forest Supplements, which should be provided to all Wilderness Rangers.

This Handbook may be used as a training guide but should not be depended on as a complete training program. This Guide is also intended as a reference to promote uniform procedures in as many wildernesses as possible. As a guide, it does not replace the "last word" of local management policy, as each wilderness, and often each unit within a wilderness, is different biologically and socially.

Because your experience is important, your comments and suggestions about the preservation of wilderness areas and the Wilderness Ranger's input toward that goal are welcome. Please make your comments to

your supervisor who can then relay your comments up the chain of command to the Recreation Staff in the Regional Office at 517 Gold Avenue, SW, Albuquerque, NM, 87102

Goals and Objectives

The goals of this Guide are to:

- provide the wilderness ranger with a ready reference
- improve the wilderness ranger's performance and promote safety
- improve the quality of the wilderness, both biologically and socially, for those who experience wilderness
- provide better recreation opportunities for the public.

This Handbook will provide both a baseline for the new Wilderness Ranger and improve the veteran Ranger's performance in the field and the office. It will also help reduce, but not replace, training time. All Wilderness Rangers will be using the same guidelines to fulfill their unit's goals and tasks assigned them. Do not misconstrue the guidelines in this handbook as being the only way those goals can be accomplished.

By becoming more familiar with methods for managing National Forest, Bureau of Land Management and National Park wilderness areas, you will be able to improve the quality of the wilderness experience and help provide the best recreation opportunity for the public.

With this in mind, this publication's objective is to provide guidelines for the person on the ground—the Wilderness Ranger.

Development, Establishment & Policies for Wilderness

History of Wilderness Establishment

Gifford Pinchot writes of the early pioneering attitude in Breaking New Ground (Pinchot 1947). He states, "After a time the practical facts of their lives drove the pioneers to regard the unending wilderness as their enemy."

Establishment of the Division of Forestry (called the Forest Service after 1905) was done mainly to protect watersheds. Refer to Chapter 2 & 3 of "Wilderness Management" (Hendee, others 1978) Miscellaneous Publication 1365 for more information.

In the Multiple Use Sustained-Yield Act of June 12, 1960 Congress established that, "National Forests...shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes." The Act continues explaining that "'multiple use' means the management of all the various renewable surface resources of the national forests so that they are utilized in a combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services."

"Wilderness Idea" - Roots & Regulations

The L-20 regulations, established July 12, 1929, were not law, but Forest Service policy. These used the term "primitive areas" to identify what we now call a wilderness area except for the Blue Range Primitive Area. Some people contend that these regulations were written more to prevent usurpation of areas by the National Park Service, which was gaining momentum at that time. The L-20 regulations were a list of permitted and prohibited

uses of the "primitive areas" The assistant to the Chief of the Forest Service at that time, L. F. Kneipp, directed Forest Supervisors to stop plans for construction of trail signs, latrines, corrals, shelters, etc. in the primitive areas. Timber harvesting was permitted under L-20 regulations within primitive areas. In 1926, Kneipp ordered an inventory of roadless lands, which identified 74 tracts totaling 55 million acres, with the largest unit being about 7 million acres (Hendee, others 1978). A 1972 Forest Service inventory found 56 million roadless acres but the minimum unit size had decreased to 5,000 acres, as opposed to 230,000 acres in the 1926 inventory.

In 1924, the Gila Wilderness in the Gila National Forest, was the first wilderness area designated and contained 574,000 acres.

The U-1 and U-2 regulations were put into effect on September 9, 1939. Recognition must be given to J. H. Sieker, assistant to the Chief of the Division of Recreation and Lands in the Forest Service, for his influence in effecting these preservation oriented regulations. These regulations were spearheaded by Division Chief Robert Marshall.

The Wilderness Act of 1964 established the wilderness preservation system whose goals you are presently working to help realize.

The Eastern Wilderness Act of 1975 helped to further define the purpose and intent of the wilderness system.

The Endangered American Wilderness Act of 1978 established one new wilderness in Arizona and three in New Mexico.

On December 19, 1980, the New Mexico Wilderness Bill as passed (Public Law 96-550). This Act established eight new wilderness areas and made additions to four other wilderness areas.

The Arizona Wilderness Act of 1984 (8/28/84) established 25 new wilderness areas and made additions to 5 existing wilderness areas.

Wilderness Management Direction

Congressional Direction

The basic management direction for National Forest Wilderness was given by Congress in the Wilderness Act (P.L. 88-557, Section 2(a)) when it noted that wilderness "...shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness and so as to provide for the protection of those areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use as wilderness...."

Congress has defined wilderness in the following way: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this act an area of undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or primitive and unconfined type of recreation; (3) has at least five

thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological or other features of scientific, educational, scenic, or historical value." (P.L. 88-577, Section 2(c)).

The Congressional act designating individual wilderness may contain language specific to a wilderness. This specific language is not applicable to other units of wilderness, it applies only to that specific wilderness.

Wilderness is thus recognized by Congress as requiring the above described attributes of naturalness, opportunities for solitude, and minimum size and may include other desirable natural features of scientific, educational, scenic or historical value.

Department of Agriculture Direction

Management direction for the Wilderness Act is further interpreted through U.S. Department of Agriculture regulations. The Code of Federal Regulations, Title 36, Part 293, provides the following objectives for wilderness management by the Forest Service, a USDA agency.

"Except as otherwise provided in these regulations, National Forest Wilderness shall be so administered as to meet the public purposes of recreational, scenic, scientific, educational, conservational and historical uses; and it shall also be administered in such a manner as to preserve and protect its wilderness character. In carrying out such purposes, National Forest wilderness resources shall be managed to promote, perpetuate, and where necessary, restore the wilderness character of the land and its specific values of solitude, physical and mental challenge, scientific study, inspiration and primitive recreation. To that end (a) natural ecological succession will be allowed to operate freely to the extent feasible; (b) wilderness will be made available for human use to the optimum extent consistent with the maintenance of primitive conditions;

(c) in resolving conflicts in resource use, wilderness values will be dominant to the extent not limited by the Wilderness Act, subsequent establishing legislation or these regulations." (36 CFR 293.2)

Title 36, Sections 293.3-293.15 also deal with wilderness but are concerned primarily with allowable but non-conforming uses such as mining, grazing, structures, and so forth. Grazing is often the most controversial of the "excepted non-conforming uses" of wilderness and is allowed where grazing was permitted prior to establishment of the wilderness.

Forest Service Direction

National direction for Forest Service wilderness management is provided in the Forest Service Manual (FSM), Chapter 2320. Sections 2320 through 2320.4 contain definitions, objectives and policy. FSH 2309.19 (Wilderness Management Handbook) outlines management of resources within wilderness and wilderness administration. The Wilderness Act (P.L. 88-577) and interpretations of the law by the Secretary of Agriculture and Forest Service, prescribe definite direction for wilderness management. They direct that wilderness will be managed to feature naturalness, opportunities for solitude, challenge and inspiration; and within these constraints to provide for recreational, scenic, scientific, educational, conservational and historical uses.

Region 3 further defined wilderness management policy in various R-3 supplements (blue pages) to the FSM 2320 section.

Exceptions allowed by the act for non-wilderness uses specified in Section 4d of the Act will be carried out under restrictions designed to minimize their impact on the wilderness. The decisive criterion in all conflicts will be to preserve and protect the wilderness character of the resource.

Wilderness Management Objectives

The following objectives were established by the Forest Service to implement the Congressional directive for wilderness mnagement to the Chief. They are based on a letter written in 1977 by Assistant Secretary for Conservation, Research and Education, Rupert Cutler.

- Maintain an enduring system of high quality wilderness.
- Perpetuate the wilderness resource.
- Provide, to the extent consistent with Items 1 and 2, opportunities for public use, enjoyment, and understanding of wilderness, and the unique experiences dependent upon a wilderness setting.
- Maintain plants and animals indigenous to the area.
- Accommodate and administer those uses or activities that are of the type generally prohibited by the Wilderness Act, but that are specifically excepted by that act, or subsequent establishing legislation, in such manner as to minimize their impact on the wilderness resource and values.
- Maintain stable watersheds within constraints of the Wilderness Act.
- Consider protection needs for populations of threatened or endangered species and their habitats in management of wilderness.
- Provide for scientific and educational study dependent upon a wilderness environment.

Wilderness Implementation Schedule

Wilderness management is not an exact science. "It is through implementation plans for individual wildernesses that the hierarchy of applicable direction, i.e., legislation, departmental regulation, and agency policy, is translated into action" (Hendee, et al, 1978).

The Land Management Plans contain the broad management directions for wilderness management. An implementation plan will be developed for each wilderness and will contain specific steps to accomplish the management direction.

The purpose of an implementation plan includes the following:

a. Gives management direction for the specific wilderness.

b. Identifies its unique inherent qualities and problems. (Incomplete or unclear managment plans could leave succeeding managers and Wilderness Rangers working in opposition to previous management direction.)

c. States specific action to be taken. Includes responsibilities and accomplishment dates.

d. Provides baseline data against which change can be compared.

e. Provides general information on Wilderness Rangers' responsibilities, user data, resource status, air and water quality information, etc.

Chain of Command

The organization by which policy is executeu is called the chain of command. In descending order, the chain of command flows from the Secretary of the Department of Agriculture to the Chief of the Forest Service, Regional Foresters, Forest Supervisors and District Rangers.

From the District Ranger the chain of command descends to the Resource or Recreation Officer (for the district), the wilderness unit manager and to you, the Wilderness Ranger.

There are various organizational schemes. On some Districts the Recreation Officer answers to the Resource Officer or the Recreation Technician answers to the Fire Management Officer (FMO). Have a clear picture of your organizations scheme so you can use the proper chain of command.

The Wilderness Ranger's Role

Function and Responsibilities

The Wilderness Ranger's function is to carry out management direction on the ground by maintaining wilderness facilities (a trail is a facility), providing agency visibility and presence, collecting needed information, disseminating information to the public, monitoring use and being sensory input for the manager. Most of the Ranger's major responsibilities are included in this Handbook.

Site Maintenance, Restoration and Monitoring

The actions of managing a wilderness varies considerably. As stated earlier, wilderness management is not an exact science. Because of the differences in wilderness units, the actions taken often differ. In one wilderness, overuse of a lake may require the closing of camping within a certain distance of that lake while in another wilderness, reducing or shifting quotas at trailheads may accomplish the same goal.

The question to ask is, "Does this action benefit the quality of this wilderness in the long run, biologically, and/or socially?" We must look to the future 50, 100 and even more years from now. To this end, the following considerations must be taken:

a. Appropriate camp site locations.
b. Inappropriate site locations.
c. Impacts elsewhere if these sites are removed.

d. Alternate sites for ones that are removed.

e. "Trashing" sites. Putting manure, logs, rocks, etc. in the site to discourage use.

f. Restoration of over used sites (a costly and time consuming affair).

Campsites

Sixty percent of the visitor's time is spent in the camping area (Hendee, et al, 1978).

a. Fire rings are the center of activity in the campsite and the area around the campsite that is the most impacted. Fire rings should be small in size, with no rocks or just enough rocks to put a small grate on, and away from rocks and cliffs that may get soot scarred, and away from trees or other perrennial vegetation. More warmth is gained by sitting between a large rock face and a fire than facing a large rock face with a fire up against it. One

hundred feet is the minimum distance a fire ring should be located from water sources.

When backpackers are using a previously unused site, a small pit dug in sandy, unvegetated soil with no rock ring, creates the least impact. After the wood is completely burned, the remaining ash can be covered with the same sod and sand removed from the pit.

b. Fire rings that are too close to the water or where there are too many in a campsite, should be removed. This can be accomplished by scattering them widely under bushes, and burial in "dishes" created by stock pawing the ground and removing the dirt at the base of trees. Rocks from fire rings should never be disposed of in lakes or streams due to water quality considerations.

Remove all litter, burned cans and plastic as well as foil from the charcoal and ashes before dispersal or burying.

Charcoal Remains

Disperse charcoal from unwanted fire rings (make sure the fire is dead out) by widely scattering it in bushes or by digging a hole in sandy soil with no vegetation and burying it. Dispersal of ashes well away from water mimicks a natural fire regime more closely than burial. Scattering nutrients is more natural than concentrating them in a few spots. (See Managing Campfire Impacts In the Backcountry, USFS INT-135 for a more detailed discussion.) After a fire ring has been eradicated, cover the remaining charcoal with forest litter, decomposed granite (DG) or other available native material.

It is a common sight to see charcoal laying in a meadow where years before a campfire was built. Often no vegetation has grown back because the charcoal absorbs radiant heat and effectively kills off plant growth. The same will be true of campfires you naturalize unless you cover the old fire scar with native material to reflect some of the heating rays of the sun.

Old campfires that are not surrounded by a used campsite and are in meadows or a more fragile community can be handled in the following ways:

- If rocks still surround the charcoal, remove and scatter them as above.
- Remove litter and foil disturbing the charcoal as little as possible.
- Cover the charcoal on site with a layer of pine needles, dirt, etc., at least 1/2" thick.
- Small branches laying on the ground can be placed over the site also.

Removing Improvements

Tools: fence stretcher, pry bar nailpuller, hammer, screwdriver, wire cutters, adjustable wrench, gloves, hacksaw, plastic bags, burlap sacks, nylon rope.

Disassemble and remove (according to the management direction in the FSM or the Management Plan) nails, wire, bear bars, tables, seats, swings, hitching posts, pipes and plastic from springs, lean-tos, rock wind barriers, etc., and fill in trenches.

"Dishing" Caused By Stock

Stock tied to trees paw at the base of the tree causing a "dishing" effect. Roots are exposed and damaged and water collects in the depression causing root rot. Trees with dishing often die.

Fill in the dishes with the dirt that surrounds the tree, seen as a slight mound a few feet from the tree. These are generally around the entire circumference of the tree. It is acceptable to put manure and rocks from campfires in the dish and then bury them with the dirt. Don't put charcoal in these dishes as it may be scattered later by pawing stock.

Naturalize sites by scattering pine needles, dirt, DG, forest litter, etc., over the site. Don't forget to scuff the collection area with your boot to naturalize it.

Site Recovery

Transplanting

Transplant plugs of native plant species to naturalize sites and aid their recovery by removing dirt from the naturalized site to a depth that will accommodate the roots of the new plant and the sod. Find an area that is away from the site and has plenty of species of the type you wish to transplant. Push a spade or shovel deep into the earth around the entire sample, then "slowly pry it out. Put it in the new location and fill around the edges so there is no air under or around the sample. Fill the "home" site with free dirt and forest litter.

Only attempt revegetation when you are certain that all use can be effectively eliminated from the site.

For further reading see "Propagation of Plant Material for Subalpine Revegetation", Joseph W. Miller, Margaret M. Miller, North Cascades N.P., Sedro Woolley, Washington, USFS No. R-6-001-1979.

Seeding

Use only native plant species for reseeding. "...the introduction of nonindigenous species is never justified." (Wilderness Management, Hendee, et al, page 355.) There are sources of bulk seed from vendors but research must be done to verify what native species can be obtained or used.

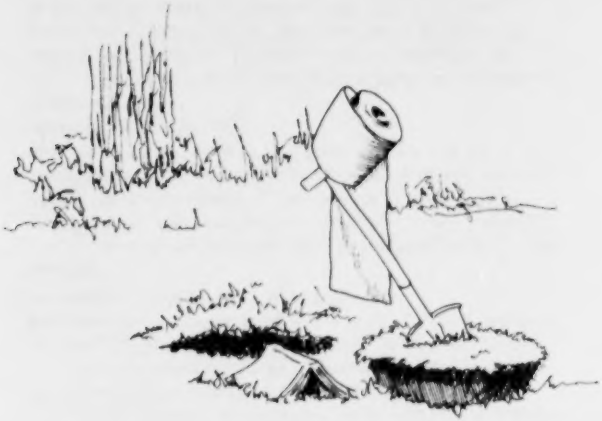
Loosening Soil

Compaction of soil is a serious problem preventing natural revegetation. To encourage natural seeding, loosening or scarifying the soil was "quite effective in furthering the establishment of grass, shrub and tree seedlings." (Hendee, et al, 1978, page 353.) Loosening soil to a depth of approximately 6" will be adequate in most cases.

Signing Sites As Closed

Enforcing closures can be difficult though they may be effective through proper education and signing. "The

most effective approach consists of helping visitors understand the reasons for closures and letting them know about alternatives." (Wilderness Management, Hendee, et al. page 353.)



Toilet Structures and Areas

Toilets may be necessary in some locations where there is heavy use and no other reasonable alternative exists, such as on the Mount Whitney Trail in the John Muir Wilderness. Decomposition and solar dehydrator toilets cost the least in the long run, but more studies and research must be conducted for these types of toilets at high elevations.

Generally, toilets are not acceptable facilities within wilderness areas. The "cat method" of human waste disposal is the preferred method of human waste disposal.

Large groups (eight or more) that are camping in the same location for more than one night should use the trench method. In a well screened location, a long way from any water, dig a narrow trench approximately 2 feet long and 10 inches deep. After each use sprinkle a small amount of dirt over the excrement. The trench can be used to within three inches of the surrounding ground level and then filled in completely and naturalized.

Visitor Contacts

Information and Education

In 1979 the Forest Service launched a program to improve its employees' response to the public. Better interrelationships between employees was also a goal. It is not felt that "the customer is always right," but we do need to respond in a positive manner to visitors. Not to do so creates ill-feelings and opposition and impedes the movement of the Forest Service toward its goals. If you show anger toward someone, it would be difficult to convince that person that she/he should move his/her camp back from the water's edge at least 100 feet.

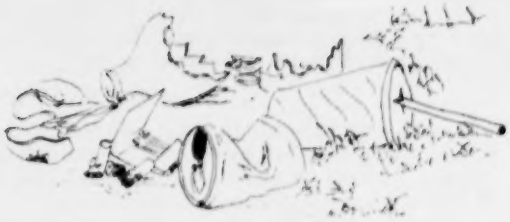
A real challenge is to decide you will not get upset, angry or otherwise be anything but pleasant to each person you meet, no matter how nasty they may be to you. If you can do this, you've acquired a useful skill.

Minimum Impact

Minimum impact (or "no trace camping") technique may be the single most important method to use in the perpetuation of a high-quality wilderness.

Minimum impact is described as the users' ability to cause the least amount of change in the environment.

All minimum impact techniques are to be applied



by wilderness rangers and all Forest Service employees and are applicable even outside wilderness. We need to set the example.

Differing opinions exist as to some of the best methods to use for some minimum impact techniques. For example, some feel that a shallow hole scraped with the boot in unvegetated soil can be used to spit toothpaste in, while others feel that a forceful spraying of toothpaste from the mouth over unvegetated soil is better. Some feel that apple cores and other organic food can be discarded out of sight. Others feel it should be burned, buried or packed out. Others feel apple cores should not be discarded in wilderness as they could produce non-native vegetation.

Distances are not easily measured in the wilderness. To a visitor, 100 feet is a guess. It is recommended that along with a distance, the number of paces be included. "100 feet" would be followed by the average number of paces the average adult would take, i.e., "Camp at least 100 feet (45 paces) from water and the trail." "Stock must be 'high lined' at least 200 feet (90 paces) from water."

Backpacking—Minimum impact rules are stated in

different ways, but the intent is the same: to minimize impacts on resources. (For minimum impact rules covered by regulations, see the Code of Federal Regulations, Title 36, Chapter II.)

Not all minimum impact rules are regulations. Know which ones you can and can't take law enforcement action on. Check your Forest orders to see which rules you can enforce. These rules of thumb are:

- Camp at least 100 feet away from bodies of water, when possible, to keep water unpolluted and waterside vegetation healthy. This also helps reduce noise and visual intrusion and gives others their own sense of solitude.
- To reduce visual impacts to other visitors, camp at least 100 feet away from trails.
- Wilderness users of today are being conscientious in packing out all their own trash, plus a little more; however, some are unaware that many packages they carry and burn in fires contain foils that don't burn or break down. If you're not sure it's paper, pack it out!

- Bury body wastes and fish entrails 4 to 8 inches deep and over 100 feet (45 paces) away from water. Use these distances as a rule of thumb to wash yourself and your dishes. Do it over rocks or mineral soil.
- Soap, toothpaste, repellent and cosmetics pollute your drinking water in the wilderness. Carry water at least 100 feet (45 paces) away from sources to wash. Perfumed articles may also attract insects. Even biodegradable soaps pollute water by causing algae growth, and should not be used in any source of water.
- Using existing fire rings, instead of building new ones, will reduce the number of ugly scars left by charcoal and reduce the chance of your fire escaping. Of course, use only those fire rings that are at least 100 feet away from water. Use of stoves is preferred and encouraged. When extinguishing a campfire, drown the fire with water, stir the ashes with a stick and make sure it's cold to the touch.
- Cutting switchbacks causes destructive erosion. Stay on trails.

- Chopping or cutting live or standing dead trees, building or improving trenches or structures, defacing signs, trees and structures adversely affects the wilderness. Leave it in its natural state!
- The building of "structures" such as rock walls, large fireplaces, bough beds, tables, rocks or log stream crossings, bear bars, and storage caches is not permitted.

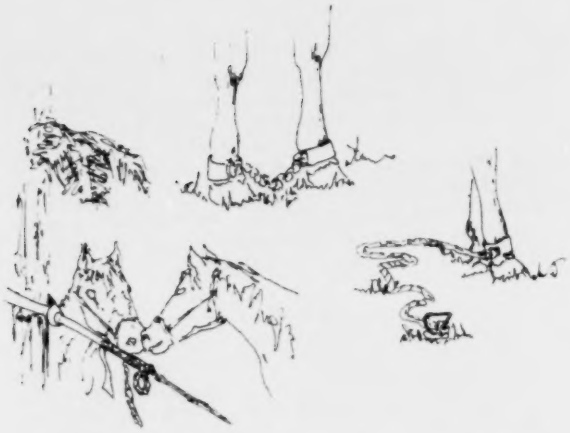
Stock Use

Refer to "Techniques and Equipment for Wilderness Horse Travel" from the U.S.F.S. Equipment Development Center, Missoula, Mont. Publication 2300-Recreation 8123 2403 and/or "Packing In on Mules and Horses", Smoke Elser and Bill Brown, Mountain Press Publishing, Missoula, MT.

It is acknowledged that "...stock use is proportionately more damaging to resources than hiking." (Hendee, et al, 1978). Because of this, care must be taken where possible to minimize the impacts of stock. Often, in his need to defend the use of stock, his income, a packer will argue that stock do not significantly affect resources. But the packer must be made to understand that by using minimum impact techniques, the resource (and his livelihood) can be perpetuated.

Guidelines

- Use hitchlines instead of tying stock to trees. Tie a "tree saver" strap or the cinch on a lashing rope around a tree and tie the other end of the rope to another tree and pull it tight. Tie stock to the hitchline so their noses can just touch the ground. This should be done over an area with little ground vegetation.
- Tying stock to a tree is acceptable only for loading and unloading. If the animal paws the dirt away from the base of the tree, remember to shovel the dirt back around the roots. Hobbling will reduce pawing.



- When leaving a site, scatter manure or bury it in old dishes at the base of trees. Leaving manure in piles makes the site an unpleasant place for stock users and backpackers alike.
- Regulations may require that stock must be tied at least 100 feet away from water at all times while loading or unloading them. Urine and manure can foul water and may carry Giardia lamblia.

Interpretation

Interpretation is the art of translating what the five senses are absorbing into another sense and is usually done verbally or through visual aide. Not only must you interpret for the visitor the natural history of the area and its ecological niches, but you must also interpret for them the philosophy behind wilderness management and the laws you are enforcing. A good book on this art is "Interpreting for Park Visitors" by William J. Lewis, Eastern Acorn Press. It is oriented toward National Park Service interpretation, but applies to any interpretive situation.

Develop this skill. It is important.

General Information

General information should be available for each Wilderness Ranger and information station, that includes answers to questions such as distances, elevation changes, packers serving the area with names and addresses, etc.

Maps are essential. Have your Forest map and a good topographical or wilderness map of your unit. If practical, carry field guides on flora and fauna for your own use as well as that of the visitor.

Know wilderness management policies, as you will be asked questions like "Why are cattle and hunting permitted?" "Why are wilderness permits required?" "What's so bad about tying my horse to a tree?"

Programs for groups should be developed to educate them before they use wilderness areas. Outfitter guide groups, conservation, school, stock-user and other groups all use the wilderness; the better the information they have, the better the chances of their being able to enjoy themselves without impacting the area. A study in the Rocky Mountains. indicated that 6th grade students were the best contacts for environmental education as they were the most influenced by rangers' interpretation programs.

Law Enforcement

Wilderness Rangers follow an expanding or progressive level of law enforcement. Start law enforcement at the lowest level necessary to accomplish the goal of resource and public protection and a reoccurance of the infraction. The progression is from attempting to educate the use and verbal warning, to written warning, to citation. Different Forests have different policies regarding citing minors. Find out what your Forest policy is.

If you start a contact by telling a visitor he will be issued a citation for a violation but then find out there were unavoidable circumstances that led to the violation, it is much more difficult to drop the tone to a reasonable enforcement level.

The Region 3 Law Enforcement Field Guide states, "Forest Officers will take criminal or administrative action on all violations occurring within their jurisdiction and authority." It continues by saying, "There must, however, be some room for judgement by the Forest Officer."

Writing Citations

To issue a citation you must have taken USFS Level II Law Enforcement training. If your supervisor permits it, you can issue a written warning (Form FS-5300-1) without this training. Writing a citation can be a nerve-wracking experience, especially if you are not familiar with the forms and procedures. During your training, make a copy of a citation and set up a simulated real-life situation, then issue the citation. Keep a copy of a completed example containing the location codes, magistrate's name and address, etc.

It is acceptable, if for some reason you do not have a citation or are unsure about the application of a regulation to a situation, to take down all pertinent personal information (a Notice of Violation can be used)

and inform the violator the incident will be discussed with your supervisor.

Volunteers may not issue citations (Form FS-5300-4), but they may record information for a citation to be processed by a qualified employee.

Arrests

Wilderness rangers will not make arrests. If you feel that an arrest is warranted, back off, contact your dispatcher and give details of the incident.

Regulations

Refer to Title 36, Part 261, Code of Federal Regulations for a complete list of prohibitions.

There has been some confusion between subparts A and B in these regulations. Subpart B regulations apply only if a Forest Supervisor or Regional Forester has issued an order for the prohibition. Subpart A regulations are in effect at all times for all Forests.

Refer to your law enforcement guide and fine schedule for a full account of prohibition for your area.

Trails

Up to 50 percent or more of the Wilderness Ranger's time, depending on the needs of the wilderness and its objectives, is spent on trail maintenance. The trail management system can be confusing. You should understand fully what is expected of you from your supervisor. There will be differences in the ranger's responsibility related to trails from unit to unit. For a complete picture and full understanding of the maintenance management system, see FSH 7709.12.

Trails have been used by humans for a long time. Native Americans established trails by continual use of routes and game trails. The cavalry was responsible for patrolling trails in the 1800's and early part of the 20th century and, in the 1930's, Civilian Conservation Corps (CCC) crews constructed many trails that are presently used. Stockmen using the area for grazing cattle and sheep and constructed many trails along deer trails or routes used by the local tribes.

Standardized specifications listed in the Trails Handbook (FSH 2309.18) will be adhered too, but differences in ecotypes requires that different trail construction and maintenance techniques be used.

Impacts on trails are caused by backpackers, stock use and by natural phenomena such as snow, water runoff, falling snags and falling cactus.

Training

Differences in methods of maintenance do occur due to resources available. Word-of-mouth descriptions on how to perform maintenance are not enough. The supervisor must show you how to perform the maintenance. A great deal of skill and knowledge is required for good maintenance and you must learn this from your supervisor and from experience.

Your supervisor will schedule specific trail projects and maintenance.

Basics of Maintenance

You must become familiar with the terminology of trail maintenance to avoid confusion, i.e., trail tread, trail bed and trail way.

Safety

Safety is for your health! Don't ruin your enjoyment of the wilderness with an injury. Refer to your Job Hazard Analysis, the Health and Safety Code, participate in safety meetings, use proper safety equipment, etc.

Loose Rock Removal and Root Removal

Remove loose rocks from the tread that are the size of your fist or greater. These must be cast to the downhill side of the trail below the level of the trail tread, not stacked on the berm. It is common to find deep ditches in trail beds with large rock berms on either side, especially

at switchbacks. This piling of rocks channels water down the trail bed not permitting runoff. If this occurs on a series of switchbacks, it may be necessary to haul the rock a short distance. Watch out for people coming up slope!!!

Generally, rocks and roots that project above the surface of the trail tread 2" or more and that can be removed by hand or pried out with a tool, should be removed. If erosion may be accelerated by removal, it is better to leave it.

Slough and Berm Removal

Material that accumulated in the trailbed should be scraped or shoveled to the daylight (fill slope) side of the trail. Berm may be shoveled on to the trail tread, as the depression in the center will cause water to flow in the trail. There should be a slight incline or outslope to the daylight side of the trail to permit water runoff.

Routine Drainage Maintenance

Clear culverts, waterbars, drainage dips, ditches, stream fords and gully crossings of any debris that may divert water to the trail instead of across it and continue in its natural channel. There are often low spots in the trail where water collects after rainstorms, during spring runoff, etc. Generally, all that is required is breaking open several one-foot sections of the berm on the downslope side to permit the water to drain off.

Maintain Waterbar

Maintaining proper drainage on a trail is the single most important task in preserving that trail.

Waterbars must be cleaned in the spring as the snow recedes and in the fall. At other times during the summer they may need attention too. Clear the drainageway on the upgrade side of the waterbar. Use soil cleared from this area to backfill downgrade behind the waterbar and pack in place by stomping. One to two feet of level outslope at the mouth (where the water runs

off the trail) is necessary for good water drainage. The end result of maintenance on a waterbar will be a sweeping turn from approximately 6 feet uphill from the waterbar, off the trail at the mouth.

Logging Out

Logging out involves removing trees, down brush, logs or a section of log or tree fallen on or across the trail, to permit passage.

Logging out is done with a one- or two-person cross-cut saw. A bucking saw is easier to use but a felling saw works too. Carry kerosene to pour over the saw when you're cutting a log with a lot of pitch and use a wedge on larger logs. This will prevent the saw from binding.

Determine which way you want the section of log to roll, then make the cuts slightly angled away from each other so the log will roll free.

Few people remember the art of sharpening cross-cut saws, and it may be difficult to get them sharpened. Check locally for older loggers who may be retired. Often they used cross-cut saws and know how to sharpen them.

For more information on cross cut saws refer to the "Cross Cut Saw Manual" under "Text Reference'."

The space left after bucking out a log must extend beyond the trail bed sufficiently to allow for a loaded pack mule to pass through without brushing its load; usually 2' on each side of the trail bed with a minimum total clearance of 8'.

Brush Cutting

Brushing involves cutting back and pruning plant growth near the trail. Clearing should normally be 8' wide and 10' high to allow safe passage of stock. It is important to cut limbs of trees or brush at the junction to the next largest limb or at the trunk. It is more esthetically pleasing, safer and reduces disease in trees. Do not leave stubs.

Dispose of this brush out of sight on the downhill side of the trail or use it to block off switchback shortcuts. Don't leave it in the trail.

There are many other maintenance activities that are performed by rangers and these are listed in the Trails Handbook.

Obliterate abandoned trails to a point out of sight of used trail intersections or for at least 100 feet with wood, rocks, dirt, etc. This is called putting a trail "to bed". Transplanting and reseeding as in 3-1.6 b, and c, is sometimes necessary to naturalize an abandoned trail.

Trail Log and Prescription Surveys

Trail log and prescriptions are necessary especially if maintenance or reconstruction contracting is to be performed on trails. Proper training on how to do these is essential and the recorder must be familiar with construction requirements as well as maintenance requirements. Logs and prescriptions can be performed at the same time, but once the log is completed, it rarely needs to be changed except when adding new items such as waterbars or eliminating an old trail section.

The log describes features of the trail such as waterbars, rock walls, blazes, etc. The prescription describes the actions that must be performed on the trail to bring it up to standard. Once the log is done, it rarely changes except, for example, when a reroute is done or more waterbars are added. The prescription is performed regularly depending on the maintenance level of the trail. The higher the maintenance level, the more often the prescription is done.

Standard abbreviations, that can be used in performing a log or prescription are as follows:

1. Meadows WM=wet meadow DM=dry meadow
2. Streams WS=wet stream DS=dry stream
3. Side Slope =SS %

4. Tread Grade =TG %
5. Switchback =SB
6. Waterbar =WB
7. Step =S
8. Clearing Inadequate =CI
9. Tread Materials
   A. Tread material is humus or dirt T=A
   B. Tread is loose rock T=B
   C. Tread is solid rock T=C
10. Rock Wall =RW
11. Hazard Tree =HT
12. Log Removal =Lr
13. Drainage =Drng. (Drainages are usually seasonal)
14. Small, Medium, Large =Sm., Med., Lg.

A form is included in the Trails Handbook that can be used to perform logs and prescriptions. A slightly different form used for doing a log for a trail with a cyclometer is included. This form shows the number of feet measured by the cyclometer on the left. The middle column is for the log and the right column is for the prescription.

Trail Log and Prescription Survey-Ranger Dist. Sheet ___ of ___

Trail Number and Name _____Date Surveyed _____

Name of Surveyors_____

Feet	Log	Prescription

The beginning and end of the trail must be described very clearly, as often there are no signs indicating where the trail is. New employees transferring in may not be able to find the trail without your accurate description.

A data processing program may be developed soon for logs that would allow for better budgeting needs to be identified by the districts. They could determine, for example, the number of water bars on a particular trail, the number of waterbars on the whole trail or the number of waterbars on the entire trail system.

Signs

(Refer to FSH 7109.11a, Chapter 35.1 and 38.1and FSH 7109.11b, 52.81.)

Wilderness rangers must remember that, unlike themselves, many visitors have never been there before.

Signs are used to allow "informed progressive travel" from one location to another. Signs will be used only at trail junctions, passes, locations where special regulations may be in effect (i e. lakes where special restrictions apply), and for scientific purposes such as enclosed research plots. Trail numbers should not be used. Any sign, when no longer required for its function, should be removed.

Sign Inventory and Specifications

(Refer to FSM 7160 and FSH 2309.18.)

Signs should be included in the log and prescription survey.

There is an art describing and correcting signs. Signs are used in wilderness only for "informed progressive travel" at intersections, at passes and where special restrictions apply. There are few instances where two signs will be needed at one intersection. Usually a sign at an intersection will have only three lines of writing on it.

The majority of signs can be routed so that only three directions are necessary to indicate the three directions at most trail intersections. There are times when more than three lines of wording must be put on a sign, e.g., to indicate directions at a four-way intersection or if two features must be named that lie in the same direction. In all situations (except for extremely rare cases), the direction that the sign faces away from should be listed on the top line. This will indicate the straight ahead direction first. Second should be the direction to the left. If there are two features that are to be indicated in the same direction, the closest one is listed first.

A single sign can be used at a majority of intersections, and an attempt will be made to reduce the number of signs within the wilderness by consolidating old signs. Careful observation at the site is crucial for precise directional signing. It is not possible to select directional signing from a map. Along with the wording of the sign and directional arrows, a simple map describing the site should be drawn describing the site where the sign will be erected. This should indicate the intersection of the trails and the exact location of the sign, which way it will face, and whether it will be mounted on a post or a tree.

The preferred method for mounting and the one most often used, is a post. The post must be at least 6 to 8 inches in diameter, the bark must be stripped from it, the top rounded off and knots shaved down to the post surface. The bottom of the sign should be approximately 52" from the ground. Allow for 2" from the top of the post to the top of the sign, the post being higher. For every two feet above ground, the post should be sunk one foot in the ground. It is important that dirt be tamped repeatedly as it is added to the post hole when setting the post.

An optional choice for sign mountings is a tree, but the tree must be large enough so that the screws used for mounting will not affect the tree adversely. Trees must be in exactly the right location to be useful for sign mounting. The bark of the tree should be removed, but not to the cambium layer, to permit a flush mounting. The bottom of the sign should be approximately 52" from the ground.

Wilderness entrance signs and their specifications are listed in the blue pages of the Signs Handbook 7109.11.

Recording Signs

A sign inventory can be developed that will show the wording on the sign, the exact location, the status of the sign (such as, "needs repair", "OK", "reword", etc.), cost of the sign and any pertinent information related to that sign. A sign number will be assigned to each one.

Not only will the present sign be recorded, but the replacement sign will also be listed. The sequence will be as follows:

1. Record information from the sign and its present condition.
2. List how the replacement sign should read, i.e.,

(old sign)	(new sign)
< Joe Crane Lk 2 1/2	^ Joe Crane Lake
^ Saddler Lake 2	<Cora Lake
^ Maclure Lake 3	Saddler Lake >
^ Isberg Pass 4	
> Clover Meadow 6	

(The three symbols above, ^, < , >, indicate straight ahead, left and right.)

3. Draw a simple map of the present location of the sign and draw the new sign as it should be if the location will be different.

Reports

A variety of reports are used to record information. The following are only examples of what can be used.

"Trail Work Summary Sheets" are used to record the amount of work accomplished on each section of trail and the time involved. (An example is included in the Appendix.) Include travel times. This can then be a measure of the amount of funds needed to accomplish goals. That is, if it takes 1/4 person hour to clean each waterbar, and there are 60 waterbars, funds are needed to pay for this, plus travel and preparation time. The longer these records are kept, the more accurate the estimates of the average amount of time to accomplish the work.

Diary

The purpose of maintaining a daily diary is so that supervisors and managers can identify problems, know how much work is being accomplished by the Wilderness Ranger and for statistics. This will depend on the requirements set forth by your supervisor.

The diary can take different forms. A written diary, which explains the details of trail work, public contacts, wildlife sightings, law enforcement action, SAR, first aid rendered, etc., can be maintained daily.

An easy method of collecting this information is through the use of management information cards.

Wilderness Management Information Cards

If a small amount of trail work is done, it can be recorded on a wilderness information management card.

These cards can also be used to record visitor contacts, SAR, law enforcement activity, problem areas, etc. and may be used in place of a diary.

Tool Maintenance

Safety—Many accidents are caused by improper tool maintenance procedures. Safety is for your health. Use gloves, guards, and all safety gear.

Keep tools in good repair. Replace them if they are questionable. A broken shovel handle means you may fail to meet your objectives. Check handles carefully for breaks, splinters and rough spots. The heads should be securely mounted on the handles. Forcefully wiggle the head on the handle to assure it is not going to come off.

Carry a 6 or 8 inch flat file to sharpen tools and extra metal wedges for loose heads.

Fire Management

(Refer to FSH 5109.17—Fireline Handbook.)

Guidelines

Fire is an integral part of the wilderness ecosystem. Along with other aspects of wilderness, it needs to be managed. Land Management Plans (LMP) and wilderness implementation schedules give direction for planned and unplanned ignition and prescribed fires. The use of fire is essential if we are to maintain wilderness areas as we know them.

Fire prevention should be part of your visitor contacts. Campfires and smoking are the two leading causes of human caused fires.

Most Forest Service employees are given a 32 hour basic fire-fighting course. After passing a step test, you receive your red card and can then work as a firefighter.

If you receive a call from the dispatcher directing you to a fire, obtain all pertinent information on the location of the fire. Leave your radio on. If you feel you cannot handle a situation, call for help.

There are some restrictions on fire fighting within wilderness areas. Motorized pumps and chainsaws can be used in fire suppression when approved by the Forest Supervisor. Anything that leaves wheel marks or "tracks" requires the Regional Forester's approval.

All wilderness information should encourage the use of stoves.

Reporting Fires

Contact your dispatcher with;

1. Township/range, section, 1/4 section and nearest named landmark (if you are unfamiliar with figuring this information from a map, have your supervisor show you how).
2. Size of fire.

3. Type of fuel the fire is burning (heavy brush, grass, light/heavy timber, etc.)
4. Rate of spread.
5. Potential for spread.
6. Number and type (civilian, volunteer, Forest Service, etc.) of persons assisting in suppression.

Search and Rescue Guidelines

Wilderness Ranger initiation or involvement in search and rescue is common and you should be well prepared to assist. First aid skills are of primary importance and if you don't have the skills, inform your supervisor and attempt to get those skills as soon as possible.

In most cases the County Sheriff has responsibility in search and rescue. The Sheriff may request you handle an incident, assist in the incident or he may inform you to assume command of the incident. Read and be familiar with any SAR agreement your District has with the Sheriff's Department.

In New Mexico, the State Police have the search and rescue responsibility, but the procedure is the same.

Initiating SAR

When initiating SAR:

- Contact the Forest dispatcher at the District office. If it is a life-threatening emergency, say "Emergency" after the call numbers, i.e., "5-51. Emergency."
- Indicate your needs; helicopter, horse, extent of injury, where person last seen, description, etc.
- Communicate information from "Head Injury Report" and "Air Operations—SAR" if applicable.

Air Operations

The following information is pertinent for facilitating helicopter rescue:

- Is it search or rescue?
- Nature of injury, if known.
- Is the patient ambulatory? Can the victim sit in a helicopter seat? Or, is a litter needed?
- Is a doctor, search and rescue team or qualified first aid person at the scene? Will someone accompany the victim?
- Exact location where the helicopter must land. Legal description and near what prominent landmark.
  - — size of helicopter landing site
  - — surrounding terrain and vegetation
  - — altitude
  - — wind direction and speed (steady, gusty), up or down canyon
  - — how far from the victim
  - — number of persons at the scene
- Medical supplies needed: What?
- Are there any fixed-wing aircraft in the area on another search?
- Who is the reporting party? Telephone number.
- Keep the helicopter informed of any changes in the original information while it is en route.
- Destination after pickup of victim (for fuel computation).

Head Injury Report

(This completed form should accompany the victim.)

Victim's Name _____ Date _____

Age _____ Time of Accident _____ Sex _____

Orientation: 1. Knows name? _____
2. Knows date? _____
3. Knows where he/she is? _____

Patient was unconscious _____ If yes, how long? _____

Patient has been drinking alcohol? _____

Patient has been using drugs? _____

Describe injury:

_____

Eyes: Pupils are — Small ___ Medium ___ Large ___
Same size _____ Different size _____

Draw pupil in diagram below:

Right eye Left eye

Pupils constrict in response to light: Right ___ Left ___

Ears: Fluid or blood in ears? _____

Pulse rate: _____ per minute.

Regular _____ Irregular _____

Respiration rate: _____ per minute.

Patient can move: Right arm _____
Left arm _____
Right leg _____
Left leg _____

Patient feels touch of hand on: Right arm _____
Left arm _____
Right leg _____
Left leg _____

Comments:

_____

Your name _____

Transporting Victims

A disabling injury or life and death emergency are the only justifiable uses of helicopters within wilderness areas as related to transporting victims.

If helicopter use has been approved by the Forest Supervisor, find a helicopter landing site and verify the specifications for a landing area. (Use section 55.5—Heliport Location and Construction, of FSH 5109.17—Fireline Handbook.)

Helicopter Procedures

Forest Service employees may not fly in a military helicopter without authorization from the Forest Supervisor.

1. Check the helicopter landing site and move any debris and objects away from the site that may blow around or get caught in the rotor. The helicopter landing site must have a clearance of at least 75 feet in diameter for a medium size helicopter (Llama, Bell, etc.).

2. When the helicopter is close enough to see you in the clearing where you want it to land, put your back to the wind and point straight ahead of you to indicate the direction the wind is blowing. Make sure you are standing well away from where the edge of the rotor will be.

It is also acceptable to throw dirt in to the air to allow the wind to blow it, indicating wind direction to the pilot. Don't throw it toward the helicopter but straight overhead.

3. To prevent injury, turn your back to the helicopter, crouch down and cover your face with your arms as it approaches the ground.

4. Once the helicopter has touched down, turn and watch the pilot until he motions for you to approach. Don't approach the aircraft until the pilot indicates for you to do so. If for some reason he must take off suddenly, you may lose your head—it has happened!!! Always stay in the pilots field of vision.

5. Follow the pilot's or helitack crew's directions at all times. If you're not sure what's expected of you, ask!!!

6. Approach a helicopter only from the front or downhill side if not on level ground, but in view of the pilot.

7. Keep riding and pack stock well away from helicopters.

8. If you fly in a helicopter, make sure no part of your seat belt is hanging out of the helicopter door. Don't indicate you're ready for the pilot to take off if you aren't.

Stock Use

Forest Service or pack station stock may be used to transport a victim to a pick-up point. Other sources for transportation include volunteer stock users or local packers.

Note: First aid is an essential aspect of SAR. If you do not have these skills, inform your supervisor and take an Advanced First Aid course as soon as possible.

Write in below the priority list of contacts for liaison and the phone and call numbers of SAR leaders.

Safety

(FSH 6709.11).

"Safety is for your health" is the motto of safety for the Wilderness Ranger. The Wilderness Ranger's job is inherently more dangerous due to the distance you are from help, the places you must travel and tools and stock you must use.

Your attitude as well as your actions make safety a reality. A job hazard analysis is required for your job. It covers all aspects of that job and explains what hazards may be encountered and how to avoid them.

"What If" situations

What if you are climbing up 10,110 foot Reeds Peak in the Aldo Leopold Wilderness and lightning begins to flash around you?

Action—Get off the ridge or off the peak and seek a lower elevation. Electricity travels downward in lightning flashes and upward along ridges to the sky. Because you are low down on a ridge does not mean you are safe. Do not pass between or stay under boulders, as lightning has been known to flash through one boulder to another. Stay out of shallow caves and away from lone trees. A forest of trees can be a refuge. If you have an ensolite pad with you, crouch on it insulating yourself from the ground. If you hear an insect-like buzzing noise, it is electricity in the air.

What if you must cross a creek that is swollen from snow runoff? What do you do?

Action—If you must cross a stream with high water, plan to do it in the early morning when water is lower or, don't do it. Unbuckle your backpack waist belt. A stick for balance will help get you across the creek but watch out—sometimes these logs get wet and freeze at night. Many people have drowned in streams.

What if you are injured in a fall? What if you are bitten by a rattlesnake? Think about this type of situation and develop a plan to get yourself out of these situations.

It is not good practice to travel alone in the wilderness without a radio. Budget restraints often limit the number of radios available for the rangers on a unit. If you won't have a radio for your tour, leave an itinerary with the supervisor or the district office and then stick to it. If you have no radio, consider traveling in pairs.

Stock Use—"The Critters"

Stock can be a very useful tool to accomplish your objectives. Base camps are often packed in by mule and

they can haul out trash you've collected. They also supply trail crews.

There are different ways that stock are used in wilderness areas by Wilderness Rangers. It is most common to have a packer who oversees the use of stock, takes care of their health needs and trains the employees. The ranger may take a horse and pack one or more mules by himself, or he may lead an animal and walk. Many packers and rangers feel that packing a mule and leading it doesn't make sense, but in the Yolla Bolly-Middle Eel Wilderness on the Covelo Ranger District this arrangement worked exceptionally well, as rangers could pack their gear and food, feed for the animal and walk the trail until trail maintenance was needed and then accomplished the work in little time. If you have a horse with you, it is unlikely that you will get off the horse to pick up a small piece of trash. You must tie the horse and mule up every time you must do maintenance, and your working time is cut down.

Special care around horses, mules and burros must be taken as they are unpredictable animals. To sum up a few items of importance while working with these animals:

Always assume that the animal will kick.

Always mount a horse or mule (yes, sometimes mules are ridden) from the left side (the horse's left if you were facing the same way it was).

When moving around an animal while packing, stick close to its rear or beyond kicking range. Don't duck under the lead rope when it's tied to rails or buildings.

Never approach stock from behind and/or without making yourself known to the animal. The constant talking to the animals around barns and corrals is not because cowboys are lonely.

Animals get rowdy at feeding time. Don't get crushed in the feeding frenzy.

If you have a packer, he will generally be in charge of all stock. Listen to what he says and take care of stock the way he wants them to be taken care of. This does vary from packer to packer, so, if you go to another wilderness area, find out how and why procedures may differ.

The packer is responsible for taking care of shoeing, veterinary needs and animal health, buying feed, pastures, fences, water troughs, tack, barns and buildings, etc. If you have questions ask. If you notice something he should be aware of, let him know. These responsibilities may differ from unit to unit.

If the Wilderness Ranger is responsible for stock, he should be trained in care and maintenance of the animals. These animals can be dangerous if used improperly. It's not a source of pride to say you've been kicked. Packing stock is an art that must be learned and can take years before even the best will be recognized as competent. Don't get in to the bad habit of pretending you know it all. Most Wilderness Rangers don't. But learn packing. Most packers will be glad to show you what they know and they should teach you how to handle and feed stock and recognize health problems.

The following is an example of a policy statement by a supervisor to any employees using District stock.

"The following policy regarding stock use was created for two reasons: 1) to ensure safe use of the stock (both for your sake and the animal's sake) and 2) to eliminate any administrative conflicts. It will be followed without exception. We encourage the use of the stock for any use you may have. They are a district resource.

- All stock use must be scheduled and approved in advance with the appropriate staff person.
- Day Use (for official use only). Only qualified riders will use horses without a packer. Packer will assign specific animals. Qualification will be determined by the packer and must be on your equipment qualifications

card. As a minimum you must be able to properly saddle, bridle, tie and care for the horse without direction. You must spend at least 16 hours riding with a packer to demonstrate proficiency. Use of pack animals always requires a packer.

- All overnight trips using stock must be accompanied by a packer.
- Any overtime needed for packing services will be paid by benefitting department (fire, timber, recreation, etc.).
- A job hazard analysis for stock use will be posted in the tack room. All stock users must read and intitial before the first trip of the season.
- When you are approaching stock, always be sure the packer knows your are in the area. Keep clear of animals while they are being packed.
- The packer is responsible for the well-being of the stock and the safety of users. His word is final!

Other Management Responsibilities

Radio Procedures

You're on the air, and everyone can hear you! Be professional and clear. Use plain English. The ten code is no longer used because of the differences in ten codes throughout the Region. National Park Service ten codes were different from Forest Service codes, which were different from County Sheriff codes. If you speak English, everyone will understand you.

A Wilderness Ranger in the Pecos Wilderness hiked to the top of Truchas Peak in the late spring. As he sat on the peak reading the register, he heard buzzing in the air and realized it was electricity. He quickly decided he would try the talus slope back to camp instead of the

much longer route back the way he had come. It was a legitimate decision, but then a single miscalculation on a short snow field sent him flying down the 50-degree slope and he slammed into a narrow band of rock at the top of a cliff. When he realized he had left his radio in camp, he thanked the gods for the warning and not the injury. Remember your radio!!!

When contacting your dispatcher, use the Forest's call name first, then your assigned call number or your last name. Your supervisor will supply you with a list of call numbers for your District.

Key your radio and wait one second before you begin talking, otherwise you may cut off the call number of the person you are trying to contact. Then, be sure you don't release the key until you have finished talking or you will cut off the end of your transmission.

Most Forests have a repeater system. Generally, channel one on your radio transmits on a direct line of sight and reaches a short distance with limited range. Channel two transmits through a repeater. Your radio sends out the message which is then retransmitted more powerfully with a wide range. It takes a moment for the repeater to engage and therefore, if you begin speaking too quickly, the first part of the transmission will not be heard.

Check-in times are established by your supervisor so that if you are injured and can't respond, a search will begin. Emergency messages and other information is also transmitted at this time. Check-in times are scheduled to interfere the least with other Forest radio traffic. It is not always possible to make contact with the outside world from many areas of the backcountry. There are lots of dead spots and you should get to know where they are and go to a different location if you can't "get out".

Wilderness Information

There is much information about the wilderness that visitorsc would like to know before they start a trip. This information must be collected and disseminated to the public information points in your district. Sources of public information are Recreation Opportunity Guides (ROGs) for the wilderness, bulletin boards, district offices, wilderness information booths, Supervisor's Offices, adjacent districts, entrance stations, trailheads, etc. These should be updated as needed. Examples of information contained in a visitor information sheet follows.

Gila Wilderness Information

(West Fork, Gila River) As of __(DATE)__

District Office Hours—8 a.m. to 5 p.m.

1. Safety Tip -
2. Snow Conditions/Elevation -
3. Water (availability, not potability)
4. Trail Conditions -
5. Wildflowers -
6. Mosquitos -
7. Fishing -
8. Bears -
9. Problem Areas -
10. Road Access/Conditions -

Paperwork

You are responsible for a variety of paper work some of which is routine. Some have due dates and others must be submitted yearly. A few of the most important are:

T & A's (Form AD-319-4). This is how you get paid. If your district requires you to complete these, check with your timekeeper for the proper procedure.

Per diem (Form AD-616). This is how you are reimbursed for expenses you incur due to requirements made of you in your job. Per diem is not taxable.

Schedules. Schedules should be posted for you and you should have your own copy. Make sure you know where you are expected to be, when, for how long and what you are expected to accomplish during that time.

Job Hazard Analyses. The job hazard analyses makes you aware of hazards that may be encountered on your job so that you can avoid them and is a required prerequisite of all jobs and before each project.

Uniform allowance (Form AD-660).

Surveys

Different types of surveys are used to obtain information on resources. These include studies to evaluate carrying capacity, Code-a-Site to evaluate individual campsites, campsite condition surveys, firewood abundance surveys, etc.

Statistics Collection

You may be required to collect various statistics using different methods. Some types and methods of statistics collection are: Wilderness Management Information cards for the collection of data as described earlier, creel census for determining number, size and species of fish that are caught, bear incident cards for information related to problem bears, etc.

Recreation Information Management (RIM)

RIM is an electronic system of banking, or storing, recreation information. RIM data is taken from wilderness permits and other sources to determine visitor days of use (VDU). This system can be used for funding or obtaining information to make a management decision.

Water Quality Testing

Some wilderness management plans require water quality testing within the wilderness. One reason that improvements are not acceptable at springs and water sources is that improvements imply that the water is safe for consumption. Water quality is a good indicator of carrying capacities.

Giardia lamblia is becoming a common pest in most wilderness waters and it's a miserable sickness to get. Giardia is a protozooan cyst that survives in water. Symptoms of Giardiasis are diarrhea, cramps, nausea, flatulance and weakness. Giardia is extremely difficult to identify in the field and requires laboratory tests.

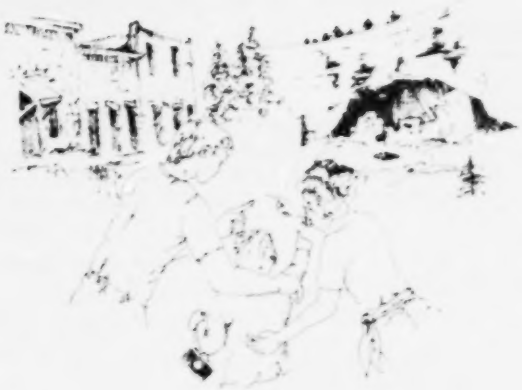
(Refer to "Water Purification ," for the best methods of purifying drinking water.)

There are several methods of water quality testing. The most common are incubation methods. Most are difficult to perform and are not totally reliable because of the lag time between taking the samples and incubation.

Check out sampling methods with your supervisor or forest hydrologist if water quality sampling is required.

Cultural Resources

Cultural resources are often found within wilderness areas. Often you may not be able to determine if an old garbage dump is worth considering important archeologically and yet you would like to get all that unsightly trash out of the wilderness. If there is any question that the dump site may be near 50 years old,



record the site on a map pinpointing the location, and then cover the site with forest litter and dirt. Make sure you notify the archeologist and have your supervisor arrange to have the site inspected for archeological significance.

Old cabins are another cultural resource that can be a problem. At times these cabins are old and falling down and are a significant safety hazard. Have your supervisor get your archeologist out to these cabins to determine their significance so either they can be torn down or a decision can be made as to their maintenance. Normally, historical structures are allowed to weather and decay naturally.

Native American artifacts and sites are also of significance. If you find artifacts, do not remove them, but pinpoint their location on maps and notify an archeologist or your supervisor of what you found and where.

An archeological clearance must be obtained when construction of trails or disturbance of the ground that has

the potential to affect cultural resources will occur. An archeological reconnaissance takes little time and may be of interest to the Wilderness Ranger if he tags along.

If you have questions regarding cultural resources, consult your District or Forest archeologist.

Feedback For Your Supervisor

Feedback is extremely important to your supervisor. Just as you like to be made aware of your successes and acknowledged for your work, so does your supervisor. After all, a supervisor is as human as you are. If you have complaints or suggestions, your supervisor should be made aware of them too.

Wilderness Living for the Ranger

"Home is where you sleep at the moment."
Unknown.

Campsite Selection

The selection of your campsite is extremely important, as it will also influence the visitor to imitate your selection. If you choose a site too near water, the visitors will think it's okay to bend the rules and do the same.

Things to Consider

Should the site be located out of view for privacy? A lot of your time will be spent with the public and it is good to have some privacy.

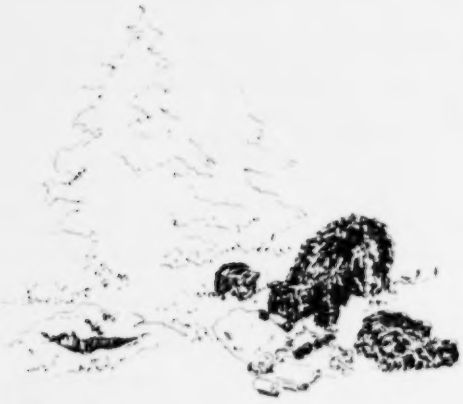
Should the site be within view of the visitor? If there is an emergency, how will the visitor find the ranger? If anyone has a question how will he get an answer? You must consider theft and vandalism while you're out patrolling too.

A site must be chosen that conforms to the minimum impact rules of thumb—100 feet (minimum) away from water and the trail. Water must be available within a reasonable distance of the camp for cooking and drinking (of course, you must purify your water). Often you will need to scout around for a while to find the ideal site.

Move the campsite as often as practical. If you've made a good campsite selection, there will be little evidence of your campsite after you move it.

It is recommended that a trench toilet be dug if more than two people will be using the site at one time for more than four days. If necessary, dig a new trench each week. A trench toilet is generally about 10" deep and one to two feet long, only wide enough to be straddled comfortably. Sprinkle dirt over excrement and burn your toilet paper in

your fire pit if you are in an area where campfires are permitted. Use the pit only to within three inches of the top, then cover it completely and naturalize the site. These toilets should be at least 500 feet from camp and, as a suggestion, down wind! Also, make sure you're screened from the trail and campsites. Leave a shovel at the toilet and put your toilet paper in a plastic bag.



Bear-Proofing

You must bear-proof your food or risk having it stolen by bears or squirrels. Find a tree with a branch that protrudes from the trunk at least 12 feet and at the end is only an inch or so in diameter. Throw a long line over the branch (don't get konked by the rock on it's way down!) Tie one stuff sack with half your food to one end of the line and haul it up to the branch, which should be at least 15 feet from the ground. Tie your other food sack on to

the other end of the line and wrap the extra line to the food sack. Give a toss and try to get the bags to hang evenly in mid-air.

Since you are often at a base camp in the wilderness, you're going to want fresh vegetables. One method of keeping them is to take two burlap sacks and an old piece of canvas. Wrap all the vegetables, cheese, etc. in the canvas and wet it. Put this bundle in the two burlap sacks and pour water over these then hang as per above. The cooling action of evaporation will keep the veggies cold and crisp for quite a while. You must wet the sacks down at least twice a day—in the morning and evening.

Water Purification

Giardia lamblia is becoming a serious problem in wilderness waters. Don't get it, it's a miserable sickness. Boil water for at least 5 minutes after it reaches the boiling point to kill any protozoa and amobeas. This is the surest method of purification. Chemical treatments for water, such as Halazone tablets or tincture of iodine, are not as sure, but extending the time between treatment and consumption reduces the chances of infection.

There are filters that can be used which claim to be a sure method of eliminating Giardia. "First Need" filters are available through Recreation Equipment Incorporated (REI). Katadyne Pocket Filters are available from Katadyn U.S.A., Inc., Suite 2204-S, 4515 Willard Avenue, Chevy Chase, MD 20015. The First Need filters have been used by some Wilderness Rangers and found to be the fastest, but the filters must be replaced frequently and are quite expensive. Contact General Ecology, Inc., 151 Sheree Blvd., Lionville, PA 19353, phone
(215) 363-7900 for filters.

Uniforms

Your uniform must be as clean as possible at all times but the public doesn't mind seeing you grubby if you've been working on the trail or rehabilitating campsites. It lets them know you're earning their dollars. Whenever possible, though, keep a clean and neat appearance. Take a spare shirt along to change into when doing dirty work or when your other one gets sweaty.

Remember that shorts should be worn only for hiking and never when doing work with tools. Wilderness Rangers should carry long pants in a day pack at all times so a change could be made when working on the trail or fighting fire.

During regular patrol hours, the rangers may be authorized to wear the Forest Service field uniform consisting of the following items:

- Official shirt with badge, patch, and name tag. The badge will be worn on the left pocket, the name tag on the right pocket flap.
- Official green field pants or shorts (see FSM 6159.15b). The shorts should be worn only if trail work or other work requiring tools is not expected.
- Eight inch top hiking boots with lug soles.
- Forest Service hat (optional).

Base Station and Barracks

Living quarters must be kept clean at all times. You may need to stain the wood or paint the cabin, replace broken windows, reshingle the roof, do rock work, re-chink, etc. Visitors are often invited in to your cabin so the interior must be clean as well. Most wilderness areas do not allow cabins to remain but if you live in one, keep it neat.

Fences need annual maintenance or reconstruction. Where barbed wire has been attached to trees in the past, boards or poles should be placed between the tree and the

barbed wire to prevent the wire strangling the tree and killing it. Broken wire must be mended and loose wire tightened. Where snowfall occurs, the fence is ususally dropped at the end of the season and put up in the spring. Two staples hammered in close to each other with the barbed wire running between them can make this job much easier. Once the wire is in place, another staple is dropped through the loop made by the other two staples to secure it.

Patrol Cabins

Often there is controversy surrounding cabins within wilderness. Some feel they should not be permitted because they are non-conforming improvements. Keeping these places clean will reduce the controversy and visual impact on visitors. Maintenance will probably be done by you. Leave information on a bulletin board or on the door as to where to get emergency help and other pertinent information. Break-ins are common in patrol cabins.

Base Camp Needs Checklist

Tent with stakes, line and groundcloth. Stove with fuel, pots, pans, pot scrubber, biodegradable soap, pot grabber. Tools including hammer, pry-bar nail puller, whisk broom to clean tent, brace and bit for sign placement, shovels, Pulaskis, pry bar, plastic bags, cross-cut saw, hand axe, small D saw, gunny sacks, and special tools you need.

Interrelationships With Other Agencies

National Park Service (NPS)

The National Park Service is an agency within the Department of the Interior.

The NPS philosophy is very similar to Forest Service wilderness management philosophy, though regulations do vary. The purpose of national parks is to preserve outstanding areas of our country for the enjoyment of this and future generations. Similar wording is used in the Wilderness Act.

You are encouraged to become familiar with National Parks and Monuments in your area and, instead of feeling a separateness from them because they are administered by "a different agency", find the similarities and help to preserve all backcountry and wilderness areas.

Some wilderness areas are contiguous with NPS backcountry areas; an exchange of information is essential for proper management of both areas.

A few differences in regulations are listed below. There may be others particular to a specific area.

- Pets are not permitted to National Park backcountry areas. Stock is permitted because they are not considered pets.
- Some motorized equipment, such as chainsaws, is permitted for use in administrative work.
- Party size and length of stay may be different.
- Hunting is not permitted within National Parks and Monuments.

Bureau of Land Management (BLM)

The Bureau of Land Management is another agency in the Department of the Interior. It manages the largest acreage of land of all government agencies and collects the largest revenues, mainly through mineral leases. There are wilderness and proposed wilderness areas on BLM land.

State Department of Fish and Game

This state agency is responsible for all wildlife on public land within the state. The Forest Service is technically responsible only for the habitat but we do work very closely with the state.

You may be involved in hunter patrols with state officers or wildlife census with state biologists.

References

"A Conceptional Backcountry Carrying Capacity Model." Jan W. van Wagtendonk, NPS Yosemite National Park, CA, 95389.

"A Selected Bibliography of Wilderness Literature." R.C. Lucas, G.H. Stankey.

American Orienteering Service, Binghampton, N.Y., 13904.

Ben Meadows Company, 2601-B West 5th Avenue, P.O. Box 2781, Eugene, OR 97402.

"Breaking New Ground", Pinchot, G. 1947.

"Carrying Capacity Assessment and Recreation Use in the National Wilderness Preservation System." Randal F. Washburne. PSW Forest and Range Experiment Station, USDA, FS, Ogden, Utah, 88401.

"Code of Federal Regulations, Title 36". Covers laws relating to the Forest Service.

"Composting Human Waste at Remote Recreation Sites." H. J. Plumley, R.E. Leonard. "PARKS" magazine, April/May/June '81.

"Conservation and the Gospel of Efficiency: The Progressive Conxervation Movement 1890-1920." Samuel P. Hays.

"Controlling Wilderness Recreation: What Managers Think and Do." R.L. Bary and C.B. Fish.

"Crosscut Saw Manual" by Warren Miller. Available from the Superintendent of Documents, US Government Printing Office, Washington, D.C., 20401, Stock No. 001-001-00434-1.

"Exploration and Empire: The Explorer and the Scientist in the Winning of the American West." William H. Goetzmann. 1966.

"Groundcover Vegetation Management at Backcountry Recreation Sites." Stephen Fay, USDA, FS, NE Forest Experiment Station, FS Laboratory, Durham, NH 1975. USDA, FS Research Note NE-201.

"Guide for Using Horses in Mountain Country." Robert W. Miller, 1974. Montana Wilderness Association, Box 548, Bozeman, MT. 59715.
"Horse Safety Guidelines." Order through Superintendent of Documents,US Government Printing Office, Washington, D.C. 20402, Stock No. 001-000-02812-0.
"Impacts of Backcountry Recreaton: site Management and Rehabilitation—An Annotated Bibliography." David N. Cole and Edwards G.S. Schreiner compilers. Intermountain Forest and Range Experiment Station, General Technical Report INT-121, Sept. 1981.
"Interpretation for Park Visitors." William J. Lewis. Eastern Acorn Press.
"Multiple Use—Sustained Yield Act of 1960" (see FSM 1020).
"Pack Hitches and Horsemanship." SW Region, USDA, FS., 517 Gold Avenue, SW, Albuquerque, NM 87102.
"Packing In on Mules and Horses", Smoke Elser/Bill Brown, Mountain Press Publishing, Missoula, MT (1980).
"Participation in Wilderness and Backcountry Litter Control: A Review of Research and Management Experience." Robert M. Muth and Roger N. Clark. USDA, FS, General Technical Report PNW-75, 1978.
"Problems and Practices in Wilderness Management: A Survement in Wilderness and Primitive Areas—FS, BLM, and IAFWA." November 30, 1976 from F. Leroy Bond, Assistant Deputy Chief.
"Soft Paths," Bruce Hampton/David Cole, Stockpole Books.
"Techniques and Equipment for Wilderness Horse Travel." USDA, FS, Equipment Development Center, Missoula, MT. 59801. Publication 8123 2403. October 1981.

"The American Environment: Readings in the History of Conservation." Edited by Roderick Nash., 1968.
"The Development of Policy and Administration of Forest Service Primitive and Wilderness Areas in the Western United States". Gilligan, 1953. PhD dissertation. University of Michigan, Ann Arbor.
"The Impact of People on Mountain Wilderness Lakes." Don C. Erman.
"Wilderness and the American Mind." Roderick Nash. 1967.
"Wilderness Digest", Don Deck. A yearly publication with information on all wilderness, Source Books and Information.
"Wilderness Horse Travel", USDA Forest Service, Equipment Development Center, Missoula, Montana.
"Wilderness Management", Hendee, J., G. Stankey, R. Lucas, 1978. USDA, FS, Miscellaneous Publication No. 1365, 1978.
"Your Way With Map and Compass." K. Disley. USDA Letter—Subject: Policies and Guidelines for Fish and Wildlife Management in Wilderness and Primitive Areas—FS, BLM, and IAFWA. November 30, 1976 from F. Leroy Bond, Assistant Deputy Chief.

Films.

"Without A Trace—The Wilderness Challenge." Regional Forester, Pacific Northwest Region, P.O. Box 3623, Portland, OR 97208.

Videos

"The Wilderness Idea".

Forest Service Handbooks:

Title 2309.18 Trails Handbook
Title 2309.19 Wilderness Management Handbook
Title 6109.11 Employee Development.
Title 6709.11 Health and Safety Code
Title 7109.11 Sign Handbook
Title 7109.11a Catalogue of Posters and Signs

Forest Service Manuals:

Title 2320—Recreation Management.
Title 7700—Transportation System.

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